

CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the above-referenced application.

Listing of Claims:

Claims 1 - 3 (Cancelled)

4. (Previously presented) A mobile communication terminal, comprising:

image projection means for projecting a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device operated by users; operation detection means for detecting operation on the selected operation-plane image projected by the image projection means;

data processing means for performing a predetermined data process based on the detection result of operation detected by the operation detection means; and

application execution management means for managing execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network, wherein the application execution management means selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a designated recognition function corresponding to the selected predefined operation-plane image;

wherein the image projection means projects the selected predefined operation-plane image corresponding to the designated recognition function designated by the designation information received from the application execution management means, from among the plurality of predefined operation-plane images; and

wherein the operation detection means has a plurality of kinds of mutually different recognition functions to recognize operation content by at least one of position, direction and movement of an operation object on the plurality of predefined operation-plane images, and detects operation on the selected operation-plane image by using the designated recognition function designated from among the plurality of kinds of mutually different recognition functions by the designation information received from the application execution management means, wherein at least part of the selected operation-plane image is changed during the operation on the selected operation-plane image according to detection of the operation content using the designated recognition function, wherein at least one of the plurality of kinds of mutually different recognition functions is a handwritten input recognition function that detects movements of the operation object corresponding to a handwriting motion of a user, and wherein, for the designated recognition function being the handwritten input recognition function, the at least part of the selected operation-plane image is changed in a manner that tracks the handwriting motion.

5. (Cancelled)

6. (Previously presented) A mobile communication terminal, comprising:

image projection means for projecting a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device operated by users;

operation detection means for detecting operation on the selected operation-plane image projected by the image projection means;

data processing means for performing a predetermined data process based on the detection result of operation detected by the operation detection means; and

application execution management means for managing execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network, wherein the application execution management means selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a designated recognition function corresponding to the selected predefined operation-plane image;

wherein the image projection means projects the selected predefined operation-plane image corresponding to the designated recognition function designated by the designation information received from the application execution management means, from among the plurality of predefined operation-plane images; and

wherein the operation detection means has a plurality of kinds of mutually different recognition functions to recognize operation content by at least one of position, direction and movement of an operation object on the plurality of predefined operation-plane images, and detects operation on the selected operation-plane image by using the designated recognition function corresponding to the selected operation-plane image, the designated recognition function being designated from among the plurality of kinds of mutually different recognition functions by the designation information received from the application execution management means, wherein at least part of the selected operation-plane image is changed during the operation on the selected operation-plane image according to detection of the operation content using the designated recognition function, wherein at least one of the plurality of kinds of mutually different recognition functions is a handwritten input recognition function that detects movements of the operation object corresponding to a handwriting motion of a user, and wherein, for the designated recognition function being the handwritten input recognition function, the at least part of the selected operation-plane image is changed in a manner that tracks the handwriting motion.

7. (Previously presented) A mobile communication terminal, comprising:
 - image projection means for projecting a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device operated by users;
 - operation detection means for detecting operation on the selected operation-plane image projected by the image projection means;
 - data processing means for performing a predetermined data process based on the detection result of operation detected by the operation detection means;
 - memory means for storing a plurality of image data corresponding to each one of the plurality of predefined operation-plane images;
 - application execution management means for executing an application program selected from a plurality of kinds of application programs that is downloaded via a mobile communication network, wherein the application execution management means selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a designated recognition function corresponding to the selected predefined operation-plane image; and
 - instruction generation means for generating an operation-plane image selection instruction in accordance with the content of the selected application program; wherein the image projection means selects an image data from the plurality of image data memorized in the memory based on the operation-plane image selection instruction generated by the instruction generation means, and projects the selected operation-plane image of the selected image data; and

wherein the application execution management means performs a data process corresponding to operation detected by the operation detection means in accordance with the content of the application program during execution of the selected application program and in accordance with the designation information that designates the designated recognition function, wherein at least part of the selected operation-plane image is changed during the operation on the selected operation-plane image according to detection of operation content using the designated recognition function, the operation content corresponding to at least one of position, direction and movement of an operation object on the selected operation-plane image, wherein at least one of the plurality of kinds of mutually different recognition functions is a handwritten input recognition function that detects movements of the operation object corresponding to a handwriting motion of a user, and wherein, for the designated recognition function being the handwritten input recognition function, the at least part of the selected operation-plane image is changed in a manner that tracks the handwriting motion.

Claims 8 – 11 (Cancelled).

12. (Previously presented) A mobile communication terminal according to claim 4, 6, or 7, wherein

the mobile communication terminal is configured by using a light source, a spatial light modulation unit for modulating light output from the light source, and an optical system for projection imaging that projects by imaging a light image output from the spatial light modulation unit on an external projection screen,

the mobile communication terminal comprises an optical system for diffused illumination for homogenously illuminating by diffusing light output from the light source to an external illumination plane, and

the light source and the spatial light modulation unit are both shared to generate a light image subject to projection and generate a light subject to diffused illumination.

13. (Original) A mobile communication terminal according to claim 12, the mobile communication terminal comprising:

a camera unit that generates image data by transforming the light-image to electric signals; and

an optical system for camera imaging for imaging the light image subject to shooting on the camera unit; wherein

the operation detection means is configured by using operation object detection means for detecting at least one of position, direction, and movement of an operation object operating on the operation-plane image and operation detection data generation means for generating operation detection data corresponding to position, direction or movement of the operation object based on the detection results of the operation object detection means; and

the camera unit and the optical system for camera imaging are both shared as the operation object detection means.

14. (Cancelled)

15. (Previously presented) A mobile communication terminal, comprising:

- an image projector that projects a selected one of a plurality of predefined operation-plane images that displays virtually an operation-plane of an operation device;
- an operation detector that detects operation on the selected operation-plane image projected by the image projector;
- a data processor that performs a predetermined data process based on the detection result of operation detected by the operation detector; and
- an application execution management device that manages an execution environment of an application program selected from a plurality of application programs that is downloaded via a mobile communication network, wherein the application execution management device selects the selected one of the plurality of predefined operation-plane images for projection according to content of the application program and generates designation information that designates a designated recognition function corresponding to the selected predefined operation-plane image, wherein the image projector projects the selected operation-plane image corresponding to the designated recognition function designated by the designation information received from the application execution management device, from among the plurality of predefined operation-plane images; and
- wherein the operation detector has a plurality of kinds of mutually different recognition functions to recognize operation content by at least one of position, direction and movement of an operation object on the plurality of predefined operation-plane images, and detects operation on the selected operation-plane image by using the designated recognition function designated from among the plurality of kinds of mutually different recognition functions by the designation information received from the application execution management device, and wherein at least part of the selected operation-plane image is changed during the operation on the selected

operation-plane image according to detection of the operation content using the designated recognition function, wherein at least one of the plurality of kinds of mutually different recognition functions is a handwritten input recognition function that detects movements of the operation object corresponding to a handwriting motion of a user, and wherein, for the designated recognition function being the handwritten input recognition function, the at least part of the selected operation-plane image is changed in a manner that tracks the handwriting motion.

16. (Previously presented) A mobile communication terminal according to claim 15,
 - wherein the mobile communication terminal is configured by using a light source, a spatial light modulation unit for modulating light output from the light source, and an optical system for projection imaging that projects by imaging a light image output from the spatial light modulation unit on an external projection screen,
 - wherein the mobile communication terminal comprises an optical system for diffused illumination for homogenously illuminating by diffusing light output from the light source to an external illumination plane, and
 - wherein the light source and the spatial light modulation unit are both shared to generate a light image subject to projection and generate a light subject to diffused illumination.

17. (Previously presented) A mobile communication terminal according to claim 16, the mobile communication terminal comprising:

a camera unit that generates image data by transforming the light-image to electric signals; and

an optical system for camera imaging for imaging the light image subject to shooting on the camera unit; wherein

the operation detector is configured by using an operation object detector that detects at least one of position, direction, and movement of an operation object operating on the operation-plane image and an operation detection data generator that generates operation detection data corresponding to position, direction or movement of the operation object based on the detection results of the operation object detector; and

the camera unit and the optical system for camera imaging are both shared as the operation object detector.

18. (Previously presented) The mobile communication terminal according to claim 15, further comprising:

a memory that stores the plurality of predefined operation-plane images.

19. (Previously presented) The mobile communication terminal according to claim 4, wherein changing the part of the selected operation-plane image includes at least one of: changing a color of the part of the selected operation-plane image, changing a luminance of the part of the selected operation-plane image, and changing the part of the selected operation-plane image into a different image.

20. (Previously presented) The mobile communication terminal according to claim 6, wherein changing the part of the selected operation-plane image includes at least one of: changing a color of the part of the selected operation-plane image, changing a luminance of the part of the selected operation-plane image, and changing the part of the selected operation-plane image into a different image.

21. (Previously presented) The mobile communication terminal according to claim 7, wherein changing the part of the selected operation-plane image includes at least one of: changing a color of the part of the selected operation-plane image, changing a luminance of the part of the selected operation-plane image, and changing the part of the selected operation-plane image into a different image.

22. (Previously presented) The mobile communication terminal according to claim 15, wherein changing the part of the selected operation-plane image includes at least one of: changing a color of the part of the selected operation-plane image, changing a luminance of the part of the selected operation-plane image, and changing the part of the selected operation-plane image into a different image.